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Patent Claims 2 page; Descriptions 3 pages; Graphs and Drawings 1 page

[54] Name of Invention: An Electronic Instruction Screen

[57] Summary

Electronic instruction screen belongs to the field of electronic technology; manufacturing technology utilizing transistors or (and) integrated circuits will all be able to produce such product.

An electronic instruction screen is consisting of many unidirectional light-emitting controllable silicon (chip) – parallel connection of equivalent circuits of unidirectional controllable silicon (chips) and light-emitting diodes that are connected in series, through controllable trigger to control the display surface composed of these light-emitting controllable elements to achieve the writing process in teaching; then by depressing a normally closed button to make the display disappear, achieving the “erasing” process of an electronic instruction screen, see attached schematic diagrams for its operation.

The primary application of an electronic instruction screen is to replace an ordinary chalk and blackboard during teaching.

A schematic diagram to the right of the summary is showing the principles of an electronic instruction screen.

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Patent Claims

1. An electronic instruction screen, which is composed of a low voltage direct current source, a switch, two potentiometers, a normally closed button, a test touch electronic pen, a numbers of light-emitting diodes and unidirectional controllable silicon (chips); the characteristics of which is that it is making the light-emitting diodes or display on by using the test touch electronic pen to trigger the unidirectional controllable silicon (chips), and making the display disappeared by using the normally closed button.

2. An electronic instruction screen as in Claim 1, the characteristics of which is that the low voltage direct current source provided is for powering the circuits, and is preferred to be 6 ~ 12 V, of course the range could be increased if it is necessary; one end of the power source is connected to the switch, while the other end is connected to a potentiometer.

3. An electronic instruction screen as in Claims 1 or 2, the characteristics of which is that the switch employed is for switching the power source on and off; it may be any variety of switches that is capable of performing such function.

4. An electronic instruction screen as in Claims 1 or 2, the characteristics of which is that the center tap of the potentiometer that is connected to the power source and the switch, is connected to one end of a second potentiometer; the other end of the second potentiometer is connected to one end of the first potentiometer; the first potentiometer is a potentiometer for brightness adjustment.

5. An electronic instruction screen as in Claim 1, the characteristics of which is that the center tap of the second potentiometer is connected to the test touch electronic pen, functioning to adjust the test touch voltage.

6. An electronic instruction screen as in Claims 1 or 2, the characteristics of which is that one end of the normally closed button is connected to one end of the second potentiometer; multiple buttons may be set up according to the (size or numbers) of controlled zones, serving to make the display disappear.

7. An electronic instruction screen as in Claims 1 or 2, the characteristics of which is that the light-emitting diodes is connected in series to the negative and positive plate of the unidirectional controllable silicon (chips); equivalent circuits may also be used: by replacing with unidirectional light-emitting controllable silicon (chips) which can be prepared from current transistors; then connecting these circuit elements in parallel, and then connected to the other end of the normally closed button and between the common connecting point of the two potentiometers to serve as the controllable light-emitting display.

8. An electronic instruction screen as in Claims 1, 6 or 7, the characteristics of which is that the other end of the test touch electronic pen is used for touching the control plate (electrode) of the controllable silicon (chip), to control the light emitting display.

Descriptions

Electronic Instruction Screen

This invention concerns an electronic instruction screen used in teaching; it belongs to the field of electronic technology, and is related to the manufacturing technologies semiconductor transistors and integrated circuits.

Today, the instructional writing tools used by people are still a combination of chalk and blackboard, the disadvantages of which are that they are not very clean and healthy, and are involving a considerable amount of effort by the teacher. Although people are favoring computer instruction, however, it is not as lively and vivid as instruction in person. The electronic instruction screen advanced by this invention has the advantages of allowing lively and vivid instruction, easy to use, and increase efficiency. This invention may also be used in other touch and show display applications.

Therefore, the primary objectives of this invention is to provide an instructional tool which can reduce the physical effort of a teacher, improve the hygienic conditions of teaching, and improve efficiency of a teacher.

The characteristics of this invention is that such electronic instruction screen is composed of a low voltage direct current source, a switch, two potentiometers, a normally closed push button, a test touch electronic pen, and a numbers of light-emitting diodes and unidirectional controllable silicon chips.

The provided low voltage direct current is for powering the circuits, preferred to be 6 ~ 12 V; of course, the range may be increased if necessary. One end of the power source is connected to the switch, the other end is connected to one end of the first potentiometer; the switch is functioning to turn the power source on and off, it could be any variety of switches which is capable of turning the power source on and off. The center tap of the first potentiometer is connected to one end of the second potentiometer; the other end of the potentiometer is connected to one end of the first potentiometer; the first potentiometer is functioning to adjust the brightness. The center tap of the second potentiometer is connected to the test touch electronic pen, allowing it to acquire an adjustable controlled voltage from the test touch electronic pen; one end of the normally closed push button is connected to one end of the second potentiometer, functioning for the disappearance of the display circuit below; multiple push buttons may be installed based on the controlled zones. After the display disappeared, release of the push button will again allow the circuit returned to the original working state. The light-emitting diodes is connected in series to the negative and positive plate of the unidirectional controllable silicon (chips); equivalent circuits may also be used: by replacing with unidirectional light-emitting controllable silicon (chips) which can be prepared from current transistors; then connecting these circuit elements in parallel, orderly assembled on a planar surface, and allow the control plate of the unidirectional controllable silicon chip to be exposed on the display surface; connect one end of the parallel connected circuits to the push button, and connect the other end to the common terminal joint of the two potentiometers, thus, completing the assembly of the entire circuit.

Here, the basic principles and application schemes of this invention is explained below in conjunction with the attached drawings and figures.

Figure 1 is a diagram showing the principles of the circuits of the electronic instruction screen.

Figure 2 is a diagram of a unidirectional light-emitting controllable silicon chip equivalent circuit.

Figure 3 is an external view of a unidirectional light-emitting controllable silicon chip.

Figure 4 is a schematic diagram of electronic instruction principles.

Based on the diagram of the principles of the circuits of the electronic instruction screen of Figure 1, when the power source switch K_1 is turned on, the test touching electronic pen is used to touch the control plate of the controllable silicon chips, the controllable silicon chips which are controlled by the control plate are touched and turn on, and the light-emitting diodes that are connect to them are lit and displaying image; the test touch electronic pen may move and touch over the display surface of the controllable silicon chips allowing the controlled diodes to turn on the display, thus achieving the writing process for the electronic instruction screen; press the normally closed push button K_2 will make the displayed image disappeared, thus achieving the “erasing” process for the electronic instruction screen. Release the push button will allow the circuit to be connected, ready (the system) for the next writing operation. Potentiometer W_1 is a potentiometer for adjusting brightness, while W_2 is a potentiometer for controlling the potential of the touch electronic pen; thus the entire operation process of the electronic instruction screen is completed.

It should be pointed out that the controllable display unit circuits of this invention may be light-emitting diodes and unidirectional controllable silicon chips connected in series, or they may be unidirectional light-emitting controllable silicon chips, or they may also be assembled integrated unidirectional light-emitting controllable silicon display screens; in discrete assembly, the area occupied by each light-emitting diode or unidirectional light-emitting controllable silicon chip on the display surface is no more than 5 mm^2 ; the display color is preferred to be yellowish green, since human eyes are more sensitive the yellowish green color, which is also more comfortable for viewing. Of course, it may be any other colors as necessary. Furthermore, the controllable silicon chips of this invention may be replaced with any other component that has the electronic characteristics of the controllable silicon chip; in short, the objective is that it can be triggered controllably through touching.

The characteristics of this invention are: using an electronic touch light-emitting display to achieve the writing process of an instruction blackboard, while using a push button switch to achieve the “erasing” process during teaching.

The advantages of this invention are: time saving, reduced physical effort, clean and healthy.

The advancements of this invention are: replacing the unhealthy chalk with clean electrical energy, replacing traditional outdated instructional method and blackboard with a modern electronic device.

Attached Drawings and Figures

Four attached figures.

(Figure 1 is a diagram showing the principles of the circuits of the electronic instruction screen.

Figure 2 is a diagram of a unidirectional light-emitting controllable silicon chip equivalent circuit.

Figure 3 is an external view of an unidirectional light-emitting controllable silicon chip.

Figure 4 is a schematic diagram of electronic instruction principles.)



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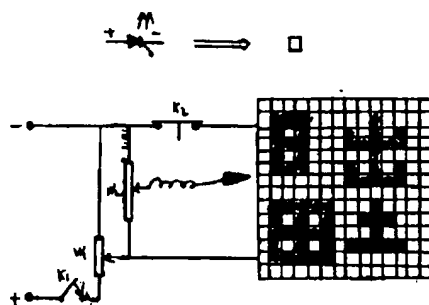
[54]发明名称 电子教学屏

[57]摘要

电子教学屏属于电子技术领域，应用晶体管或集成电路的生产技术都可使这种产品投入生产。

电子教学屏是把许多单向发光可控硅—单向可控硅和发光二极管串联的等效电路并联起来，通过可控触发控制这些发光可控单元组成的显示面就可以实现教学书写的过程，用常闭按钮的按下，使显示消失，实现了电子教学屏“擦”的过程，原现示意图附图。

电子教学屏的主要用途就是代替普通黑板和粉笔，进行教学。



权 利 要 求 书

1、一种电子教学屏，它是由一个低压直流电源、一个开关、两个电位器、一个常闭按钮、一个测试触摸电笔，一些发光二极管和单向可控硅组成；其特征在于通过测试触摸电笔触发单向可控硅，使发光二极管导通显示、通过常闭按钮使显示消失。

2、如权利要求 1 的电子教学屏，其特征在于配置的低压直流电源是供电路工作使用，以 $6 \sim 12\text{V}$ 为好，当然根据需要范围可大些，一端和开关连接，另一端和第一个电位器的一端连接。

3、如权利要求 1 或 2 的电子教学屏，其特征在于使用的开关是做为电源开关，可以是各种具有这种作用的开关。

4、如权利要求 1 或 2 的电子教学屏，其特征在于和电源及开关相连的电位器的中心抽头和第二个电位器的一头相连；并且第二个电位器的另一头和第一个电位器的一头相连，第一个电位器是作为亮调节的电位器。

5、如权利要求 1 的电子教学屏，特征在于第二个电位器的中间抽头和测试触摸电笔相连，起调节测试触摸电压的作用。

6、如权利要求 1 的电子教学屏，其特征在于常闭按钮的一端和第二电位器的一头相连，并且可根据控制区域设置多个按钮，是做为消失显示用的。

7、如权利要求 1 的电子教学屏，其特征在于发光二极管和单向可控硅的阴阳极串联；并且可以用等效电路：通过

当前晶体管可以制造的单向发光可控硅代替；再把这些单元电路并联，再连接在常闭接纽的另一端和两个电位器公共接头之间是做为可控发光显示。

8、如权利要求 1、6 或 7 的电子教学屏，其特征在于测试触摸电笔的另一端是用来和可控硅的控制极进行触摸控制发光显示。

电子教学屏

本发明是一种为教学使用的电子教学屏，属于电子技术领域，并与半导体晶体管和集成电路的生产技术有关。

迄今人们用着书写示教的器具还是黑板和粉笔的组合，其缺点是不清洁卫生，教师的劳动强度大。虽然人们崇尚电脑教学，但它毕竟没有人与人之间的言传身教生动活泼，本发明所提出的电子教学屏，以生动的教学、方便的使用、提高效率，显示出它的优点。本发明还可以用于其它触摸显示指示的地方。

因此，提供一种有利于减轻教师劳动强度，改善教学卫生条件，提高教师工作效率的教学器具是本发明的主要目的。

本发明的特征在于这种电子教学屏是由一个低压直流电源、一个开关、两个电位器，一个常闭按钮，一个测试触摸电笔，一些发光二极管和单向可控硅组成。

配置的低压直流电源是供电路工作使用，以 $6 \sim 12\text{V}$ 为好。当然，根据需要范围还可以大一些，电源一端和开关连接，另一端和第一个电位器的一端连接，开关是做为电源开关，可以是各种类型的开关，只要能达到断开和并闭电源的作用就可以。第一个电位器的中心抽头和第二个电位器的一头相连，并且第二个电位器的另一头和第一个电位器的一头相连，第一个电位器起亮度调节作用。第二个电位器的中心抽头和测试触摸电笔相连，以便在测试触摸电笔上获得可

调的控制电压，常闭按钮的一端和第二个电位器的一头相连，是做为消失后面的显示电路用的；还可以根据控制区域的不同设置多个按钮。当显示消失后，放下按钮电路又回到原工作状态。发光二极管和单向可控硅的阴阳极串联，或用它们的等效电路通：过当前晶体管生产技术可以制造的单向发光可控硅代替；再把这些单元电路并联起来，整齐的组装在一个平面上，并且把单向可控硅的控制极露出在显示面上；把并联在一起的电路的一端和按钮相连，另一端和两个电位器的公共端接头相连，这样，整个电路就组装好了。

现在参照附图说明本发明的基本原理及实施方案：

附图 1、电子教学屏电路原理图

附图 2、单向发光可控硅等效电路图

附图 3、单向发光可控硅外形视图

附图 4、电子教学屏原理示意图

根据电子教学屏电路原理图 1，当电源开关 K_1 接通时，用测试触摸电笔去触摸可控硅的控制极，受控制极控制的可控硅触摸导通，与它相连的发光二极管就发光显示，测试触摸电笔在可控硅显示面上触摸移动，受控制的二极管就导通显示，这样就实现了电子教学屏的书写过程，按下常闭按钮 K_2 显示就消失，实现了电子教学屏的“擦”的过程。放下按钮电路接通，为下一次书写做好准备。电位器 W_1 是亮度调节电位器， W_2 是触摸电笔电位控制电位器，这样就完成了电子教学屏使用的全过程。

需要指出的是，本发明的可控显示单元电路，可以是发光二极管和单向可控硅的串联，也可以是单向发光可控硅，还可以是通过集成生产过程组合在一起的单向发光可控硅显示屏，在分立组装中，每个发光二极管或单向发光可控硅所在显示面的面积不大于 5 毫米²，显示颜色以黄绿色较好，因为人眼对黄绿色较敏感，也较舒适。当然，根据需要也可以用其它颜色。再一个，本发明中的可控硅还可以用其它具有可控硅电子特性的元件代换，总之，目的只是可控触发。

本发明的特点：以电子触摸发光显示来实现教学黑板的书写过程，以按钮开关实现教学书写“擦”的过程。

本发明的优点是：省时、省力、清洁卫生。

本发明的进步性：以电能的使用代替粉笔的不卫生，以现代电子器件代替传统教学，黑板的落后性。

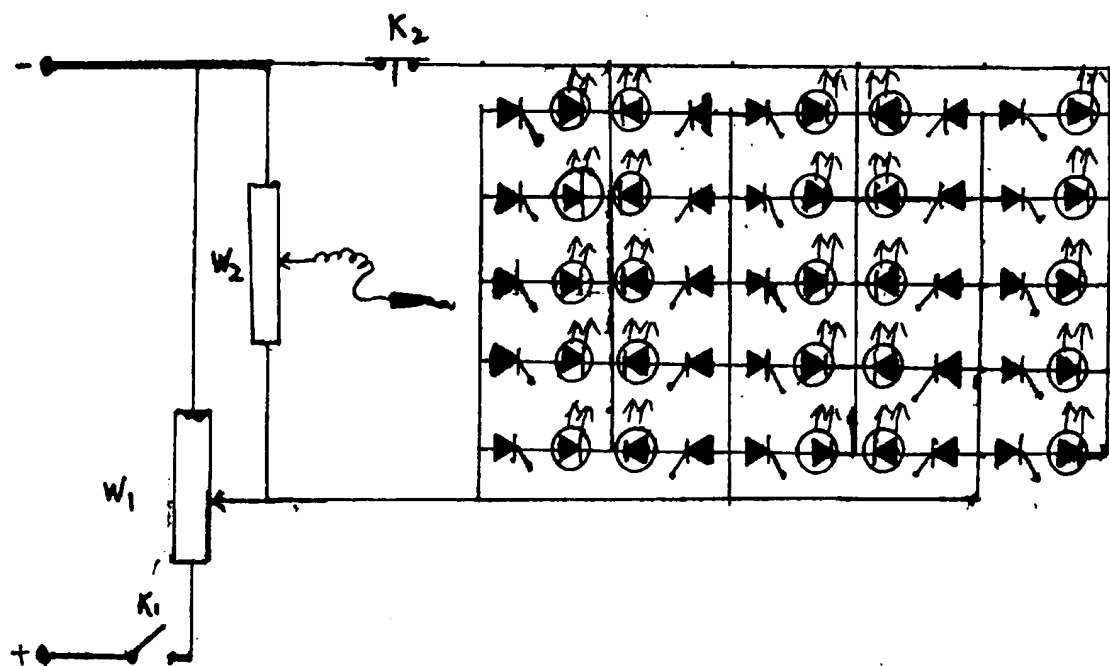


图 1

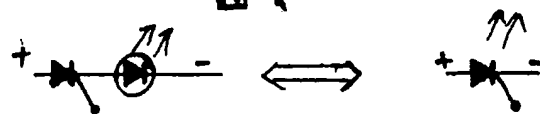


图 2



图 3

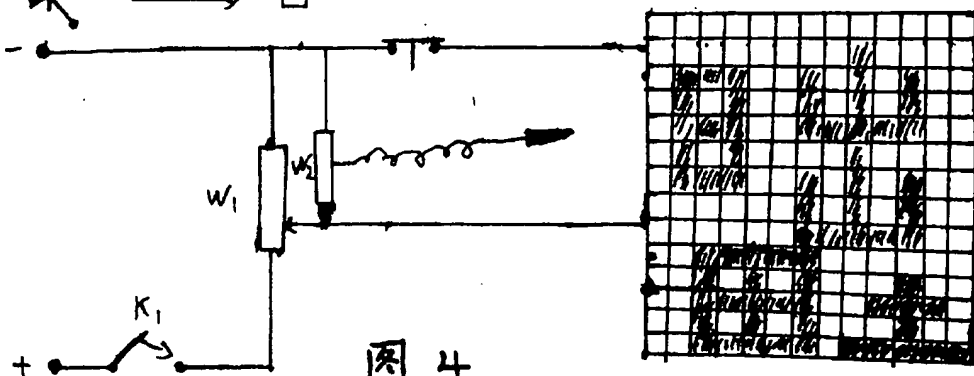
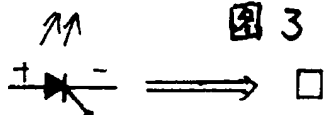


图 4

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